Applicant: Chin-Ti Chen et al

Serial No.: 09/996,202

Filed: November 28, 2001

Page : 2 of 13

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A compound of the following formula:

$$\begin{bmatrix}
R^1 & R^2 \\
& & & \\
& & & \\
R^4 & R^3
\end{bmatrix}$$

wherein

each of R^1 - R^4 is, independently, H, substituted or unsubstituted C_{1-6} alkyl, OH, C_{1-6} alkoxy, $N(R^6)(R^7)$, in which each of R^6 and R^7 is, independently, H or substituted or unsubstituted C_{1-6} alkyl, NO_2 , CN, or CO_2R^8 , in which R^8 is H or C_{1-6} alkyl; and

wherein R^5 is H, substituted or unsubstituted C_{1-6} alkyl, substituted or unsubstituted C_{2-6} alkenyl, substituted or unsubstituted C_{2-6} alkynyl, substituted or unsubstituted C_{6-20} aryl or C_{6-20} aryl substituted with OH, C_{1-6} alkoxy, $N(R^{26})(R^{27})$, substituted or unsubstituted alkylaryl in which the alkyl moiety is one or more substituted C_{1-6} alkyl groups, substituted or unsubstituted C_{4-20} heteroaryl, C_{10-20} diarylaminoaryl, or is absent, or B and D, together with R^5 and R^{11} , are substituted or unsubstituted aryl; in which each of R^{26} and R^{27} is, independently, H, substituted or unsubstituted C_{1-6} alkyl, substituted or unsubstituted aryl, substituted or unsubstituted alkylaryl, NO_2 , CN, or CO_2R^{28} , in which R^{28} is H or C_{1-6} alkyl;

wherein A is O, S, $N(R^9)$ in which R^9 is absent, H, substituted or unsubstituted alkyl, or substituted or unsubstituted aryl, N=N, or N=C(R^{10}) in which the C is adjacent to B and in which R^{10} is substituted or unsubstituted alkyl, or substituted or unsubstituted aryl;

wherein B is C or N;

Applicant: Chin-Ti Chen et al

November 28, 2001

Page

wherein D is N. NH, or C(R¹¹) in which R¹¹ is substituted or unsubstituted alkyl, or substituted or unsubstituted aryl, or B and D, together with R⁵ and R¹¹ are substituted or unsubstituted aryl;

and wherein E is C or Si;

provided that when A is O and D is N, then B is C and the floating double bond is between B and D;

further provided that when A is N(R⁹) and R⁹ is absent, then B is N, R⁵ is absent, D is NH, and the floating double bond is between A and B;

further provided that when A is N=N, then B is C, D is N, and the floating double bond is between B and D;

further provided that when A is N=C(R¹⁰), then B is N, R⁵ is absent, D is C(R¹¹), and the floating double bond is between B and D;

further provided that when A is N(R⁹) and R⁹ is H, alkyl, or aryl, then B is C, D is C(R¹¹), and the floating double bond is between B and D;

further provided that when A is O or S and D is C(R¹¹), then B is C and the floating double bond is between B and D.

- 2. (Original) The compound of claim 1, wherein A is O.
- (Original) The compound of claim 2, wherein each of R¹-R⁴ is H. 3.
- (Currently Amended) The compound of claim 2, wherein R⁵ is substituted or 4. unsubstituted aryl, or substituted or unsubstituted alkylaryl; unsubstituted C₆₋₂₀ aryl or C₆₋₂₀ aryl substituted with OH, C_{1.6} alkoxy, N(R²⁶)(R²⁷), or alkylaryl in which the alkyl moiety is one or more substituted C_{1.5} alkyl groups; in which each of R²⁶ and R²⁷ is, independently, H. substituted or unsubstituted C₁₋₆ alkyl, substituted or unsubstituted aryl, substituted or unsubstituted alkylaryl, NO₂, CN, or CO₂R²⁸, in which R²⁸ is H or C_{1.6} alkyl.

Applicant: Chin-Ti Chen et al Attorney's Docket No.: 08919-053001 / 03A-890425

Serial No.: 09/996,202

Filed: November 28, 2001

Page : 4 of 13

5. (Original) The compound of claim 4, wherein R⁵ has the following formula:

$$R^{25}$$
 R^{24}
 R^{23}
 R^{22}

wherein each of R^{21} - R^{25} is, independently, H, substituted or unsubstituted C_{1-6} alkyl, OH, C_{1-6} alkoxy, $N(R^{26})(R^{27})$, in which each of R^{26} and R^{27} is, independently, H, substituted or unsubstituted C_{1-6} alkyl, substituted or unsubstituted aryl, substituted or unsubstituted alkylaryl, NO_2 , CN, or CO_2R^{28} , in which R^{28} is H or C_{1-6} alkyl.

- 6. (Original) The compound of claim 5, wherein each of R²¹-R²⁵ is, independently, H or methoxy.
- ⁹ 7. (Original) The compound of claim 5, wherein each of R²¹-R²⁵ is, independently, H or tert-butyl.
- 8. (Original) The compound of claim 5, wherein each of R²¹-R²⁵ is, independently, H or trifluoromethyl.

Applicant: Chin-Ti Chen et al

Serial No.: 09/996,202

Filed: November 28, 2001

Page : 5 of 13

9. (Original) The compound of claim 1, wherein the compound has the following

formula:

- 10. (Canceled)
- 11. (Original) The compound of claim 1, wherein the compound has the following formula:

Applicant: Chin-Ti Chen et al Serial No.: 09/996,202

: November 28, 2001 Filed

Page : 6 of 13

> (Original) The compound of claim 1, wherein A is N(R⁹), in which R⁹ is absent. 12.

(Original) The compound of claim 12, wherein the compound has the following 13. formula:

(Original) The compound of claim 1, wherein the compound has the following 14. formula:

Applicant: Chin-Ti Chen et al Serial No.: 09/996,202

Filed: November 28, 2001

Page : 7 of 13

15. (Currently Amended) An electroluminescence device comprising a substrate, a hole transporting layer, and an electron transporting layer, wherein at least one of the hole transporting layer, the emitting layer, and the electron transporting layer comprises a compound having the following formula:

$$\begin{bmatrix}
R^1 & R^2 \\
A & B
\end{bmatrix}$$

$$\begin{bmatrix}
R^5 & B
\end{bmatrix}$$

$$\begin{bmatrix}
R^4 & R^3
\end{bmatrix}$$

wherein

each of R^1 - R^4 is, independently, H, substituted or unsubstituted C_{1-6} alkyl, OH, C_{1-6} alkoxy, $N(R^6)(R^7)$, in which each of R^6 and R^7 is, independently, H or substituted or unsubstituted C_{1-6} alkyl, NO_2 , CN, or CO_2R^8 , in which R^8 is H or C_{1-6} alkyl; and

wherein R^5 is H, substituted or unsubstituted C_{1-6} alkyl, substituted or unsubstituted C_{2-6} alkenyl, substituted or unsubstituted C_{2-6} alkynyl, substituted or unsubstituted C_{6-20} aryl or C_{6-20} aryl substituted with OH, C_{1-6} alkoxy, $N(R^{26})(R^{27})$, substituted or unsubstituted alkylaryl in which the alkyl moiety is one or more substituted C_{1-6} alkyl groups, substituted or unsubstituted C_{4-20} heteroaryl, C_{10-20} diarylaminoaryl, or is absent, or B and D, together with R^5 and R^{11} , are substituted or unsubstituted aryl; in which each of R^{26} and R^{27} is, independently, H, substituted or unsubstituted C_{1-6} alkyl, substituted or unsubstituted aryl, substituted or unsubstituted alkylaryl, NO_2 , CN, or CO_2R^{28} , in which R^{28} is H or C_{1-6} alkyl;

wherein A is O, S, $N(R^9)$ in which R^9 is absent, H, substituted or unsubstituted alkyl, or substituted or unsubstituted aryl, N=N, or N=C(R^{10}) in which the C is adjacent to B and in which R^{10} is substituted or unsubstituted alkyl, or substituted or unsubstituted aryl;

wherein B is C or N;

wherein D is N, NH, or C(R¹¹) in which R¹¹ is substituted or unsubstituted alkyl, or substituted or unsubstituted aryl, or B and D, together with R⁵ and R¹¹ are substituted or unsubstituted aryl;

Applicant: Chin-Ti Chen et al Attorney's Docket No.: 08919-053001 / 03A-890425

Serial No.: 09/996,202

Filed: November 28, 2001

Page : 8 of 13

and wherein E is C or Si;

provided that when A is O and D is N, then B is C and the floating double bond is between B and D;

further provided that when A is N(R⁹) and R⁹ is absent, then B is N, R⁵ is absent, D is NH, and the floating double bond is between A and B;

further provided that when A is N=N, then B is C, D is N, and the floating double bond is between B and D;

further provided that when A is $N=C(R^{10})$, then B is N, R^5 is absent, D is $C(R^{11})$, and the floating double bond is between B and D;

further provided that when A is $N(R^9)$ and R^9 is H, alkyl, or aryl, then B is C, D is $C(R^{11})$, and the floating double bond is between B and D;

further provided that when A is O or S and D is C(R¹¹), then B is C and the floating double bond is between B and D.

- 16. (Original) The device of claim 15, wherein A is O, B is C, and D is N.
- 17. (Original) The device of claim 16, wherein each of R¹-R⁴ is H.

Applicant: Chin-Ti Chen et al Serial No.: 09/996,202

Filed : November 28, 2001

Page : 9 of 13

(Original) The device of claim 15, wherein the compound has the following 18. formula:

(Original) The device of claim 15, wherein the compound has the following 19. formula:

Applicant: Chin-Ti Chen et al Serial No.: 09/996,202

Filed : November 28, 2001

: 10.of 13 Page

(Original) The device of claim 15, wherein the compound has the following 20. formula:

21. (Original) The device of claim 14, wherein the compound has the following formula: